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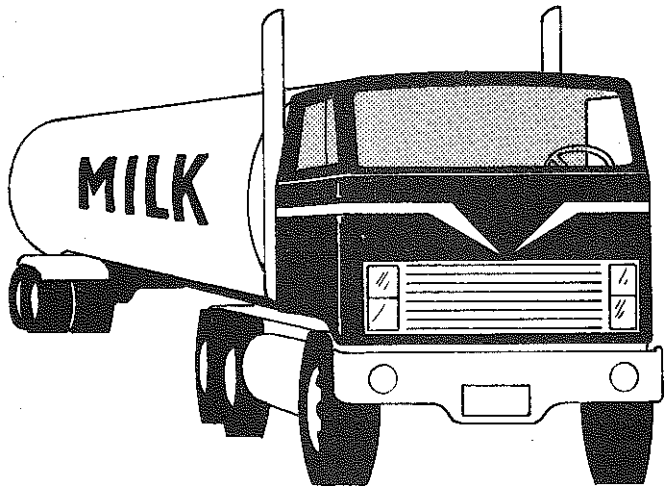
THE STRUCTURE AND CHARACTERISTICS OF THE MILK ASSEMBLY SYSTEM IN NEW YORK STATE



Bruce L. Anderson

Department of Agricultural Economics
Cornell University Agricultural Experiment Station
New York State College of Agriculture and Life Sciences
A Statutory College of the State University
Cornell University, Ithaca, New York 14853

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Bruce L. Anderson

Department of Agricultural Economics
Cornell University Agricultural Experiment Station
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THE STRUCTURE AND CHARACTERISTICS OF THE MILK ASSEMBLY SYSTEM IN NEW YORK STATE

SECTION I

INTRODUCTION AND METHODOLOGY

Introduction

Probably no other commodity, agricultural or industrial, requires more transportation than milk. A milk truck must visit each dairy farm at least every other day. Due to its perishable nature, milk must be anticeptically handled and processed within hours of production. Long-term storage is not yet commercially feasible. Consequently milk at bottling plants and retail outlets must be constantly replenished, creating daily demands on an already transportation-intensive industry.

When transportation costs were low and stable little attention was given to the transportation component in the marketing bill for milk. Today, with significantly higher and more erratic fuel costs, there is serious concern about the cost of moving milk from producers to consumers.

The most concern is expressed by milk haulers themselves. Haulers are caught in a rate-cost squeeze. In recent years, the cost of every item used by haulers has increased substantially. Chief among these are the cost of vehicles, the cost of labor and the cost of fuel. At the same time, dealers have been reluctant to increase hauling rates. Prior to September 1981, the New York-New Jersey Federal Milk Marketing Order limited the amount proprietary firms could receive from the order and charge producers for milk assembly. If a proprietary dealer paid haulers more than that amount, the excess came out of dealer margins. While cooperative dealers were allowed to deduct from member receipts the full cost of hauling, they were not inclined to increase hauling rates in order to remain competitive with proprietary firms. The result is that many milk haulers face a financial crisis due to this rate-cost squeeze. Although recent changes in marketing order provisions may alleviate some of this problem, milk transportation will continue to be a significant economic issue in the New York dairy industry.

A viable hauling system is essential to the New York dairy industry. This study was undertaken to provide a better understanding of the bulk milk assembly system in New York State. The general purpose of this report is to describe the structure and characteristics of milk hauling in New York State and to assist in improving and maintaining a healthy and efficient milk assembly system.

Methodology

A list of all licensed milk haulers and milk dealers operating in the state was obtained from the Division of Dairy Industry Services, New York State Department of Agriculture and Markets. Most milk dealers do no operate hauling vehicles. But some do. Since dealers are not required to obtain a separate hauling license they were also included in the survey.

All haulers and dealers thought to operate less than nine trucks were sent a questionnaire in early June 1980. Two follow-up letters were mailed - one in early July and the other in early August. Haulers that did not respond to the initial letter or the follow-ups were contacted by telephone and asked to return their questionnaires.

Haulers and dealers thought to operate nine or more vehicles were contacted personally during the months of June and July.

Surveys were mailed to 190 haulers and 285 dealers. Responses were received from 155 haulers and 227 dealers. Most dealers indicated they did not haul bulk milk. The respondents are estimated to represent a significant proportion of the firms and trucks hauling milk in New York State.

A copy of the survey form is presented in Appendix A.

In general the quality of the information supplied by the respondents was excellent. However, all surveys were checked for accuracy and internal consistency. A response to a question that appeared to be a general estimate rather than an accurate observation was discarded. In processing the information, enough good data was available to allow us to demand quality over quantity (number of observations).

SECTION II

STATEWIDE RESULTS OF THE SURVEY

Results of the Survey

One hundred-fifty haulers and dealers indicated they were hauling milk within New York State during June and July 1980. These haulers reported operating 678 vehicles. 1/

Characteristics of Hauling Firms

Size of Hauling Firms

Most of the firms were small. Over one-third (35%) of the haulers operated only one vehicle (Table 1). Another third had two or three vehicles and the remainder operated four or more trucks. However the later group provided over 75 percent of the vehicles used for milk hauling in New York State. The data supported our general understanding of the hauling system. That is, the industry is basically made up of a large number of small firms, with a few large firms providing the bulk of the rolling stock.

Of the 678 power units, 440 were straight chassis and 238 tractors. There were 249 trailers used on these tractors. Almost one-half the firms operating straight chassis trucks had only one vehicle. Those using tractor trailers were somewhat larger. About 15 percent of the straight chassis, tractors and trailers were used as reserve vehicles. However, most reserve vehicles were found within a very few firms.

Meeting Additional Hauling Demands

Given the general lack of reserve vehicles, operators were asked to indicate how they met hauling demands during flush periods and breakdowns (Table 2). Multiple answers were accepted. A near majority of the responses (48%), indicated they spread hauling demand over other existing vehicles. The next most popular method was to request assistance from another milk hauler (28%). Still others indicated they temporarily rent or lease additional equipment or request assistance from milk dealers (7%).

Table 2
Methods to Meet Additional Hauling Demands
New York State, 1980

Method	Percent of Responses
Spread Hauling Demands Over Existing Vehicles	48.2%
Request Assitance from Another Hauler	28.1
Temporarily Rent or Lease Additional Vehicles	13.7
Request Assistance from Milk Dealer	6.5
Other	3.5
Total	100.0%

1/ Hereafter any individual or firm hauling bulk milk will be referred to as a hauler. The title includes both milk dealers and independent haulers.

Table 1
Number of Vehicles Per Hauler
New York State, 1980

Number of Vehicles	Number of Haulers in Each Category									Percent of Total
	Operated Year-Round				Reserve					
	Straight Chassis	Tractor	Trailers	Total Power Units	Straight Chassis	Tractor	Trailers	Total Power Units	Total Power Units	
0	16	101	101	1	111	130	133	97	1	0.7
1	62	17	16	61	29	13	12	37	52	34.7
2	29	10	7	28	7	4	2	9	27	18.0
3	11	6	9	12	3	2	1	3	18	12.0
4	7	2	2	7	0	1	0	2	8	5.3
5	8	2	3	6	0	0	0	0	5	3.3
6	2	1	2	6	0	0	0	0	2	1.3
7	3	1	2	5	0	0	0	1	6	4.0
8	1	3	3	4	0	0	1	0	7	4.7
9	4	3	0	4	0	0	1	0	4	2.7
10	2	0	0	4	0	0	0	0	5	3.3
11 - 12	3	0	0	4	0	0	0	0	4	2.7
13 - 14	1	2	2	3	0	0	0	0	3	2.0
15 - 20	0	1	2	2	0	0	0	0	5	3.3
Over 20	1	1	1	3	0	0	0	0	3	2.0
Total	150	150	150	150	150	150	150	150	150	100.0%
Vehicles	388	207	213	595	52	31	36	83	678	

Number of Dealers Per Hauler

Over 62 percent of the haulers provided their transportation services to only one dealer (Table 3). Very few (11%) hauled for more than three dealers. The distribution of truck operators working for cooperative and proprietary firms is about equal.

Number of Haulers Per Dealer

Respondents were asked to identify the dealers for which they hauled milk. The distribution of the number of haulers per dealer is presented in Table 4. The majority of dealers (59 or 63%) were served by only one hauler. However on the other extreme, one milk dealer was contracting with 21 haulers and another was being served by 30 haulers.

Table 4
Number of Haulers Per Dealer
New York State, 1980

Number of Haulers Per Dealer	Number of Dealers	Percent of Dealers
1	59	63.4%
2	10	10.8
3	4	4.3
4	6	6.5
5	2	2.1
6 - 10	6	6.5
11 - 15	4	4.3
16 - 20	0	0.0
21 - 30	2	2.1
Over 30	0	0.0
Total	93	100.0%

Counties with Farm Stops

Most haulers (61%) have farm pickups in only one or two counties (Table 5). Those that do operate in several counties typically had several vehicles or engaged in direct delivery.

Table 5
Number of Counties with Farm Stops
New York State, 1980

Number of Counties	Number of Haulers	Percent of Haulers
0	5	3.3%
1	41	27.3
2	48	32.0
3	19	12.7
4	9	6.0
5	10	6.7
6	3	2.0
7	3	2.0
Over 7	9	6.0
No response	3	2.0

Table 3
Number of Cooperative, Proprietary and Total Dealers Per Hauler
New York State, 1980

Number of Dealers Per Hauler	Number of Haulers Delivering To: Cooperative Dealers	Proprietary Dealers	Both Types Dealers	Percent of Total
0	61	51	0	0.0%
1	63	75	94	62.7
2	16	8	25	16.7
3	7	4	15	10.0
4	1	7	6	4.0
5	0	2	2	1.3
6	0	1	2	1.3
7	0	0	1	0.7
Over 7	0	0	3	2.0
Unknown	2	2	2	1.3
Total	150	150	150	100.0%

Ownership and Financing

The vast majority of respondents (84%) indicated their vehicles were owned by themselves or their firm (Table 6). Only a small fraction of vehicles were leased or owned by a proprietary dealer, cooperative dealer or other private individual.

Table 6
Vehicle Ownership
New York State, 1980

Type of Owners	Number of Firms 1/	Percent of Responses 1/
Self or Firm	143	84.6
Proprietary Dealer	9	5.3
Cooperative Dealer	5	3.0
Leasing Firm	8	4.7
Other Private Individuals	4	2.4
Total	169 1/	100.0% 1/

1/ Multiple responses were possible.

Since most vehicles were owned by the operator, haulers were asked to identify how they financed their vehicles (Table 7). The primary method of financing was with a commercial bank loan (50%). The second most popular method of financing was to pay cash (26%). This was followed by loans from dealerships. Private loans and loans from milk dealers were of little significance.

Table 7
Method of Financing Vehicles
New York State, 1980

Method	Number of Firms 1/	Percent of Responses 1/
Self or Firm (Paid Cash)	47	26.3%
Commercial Bank Loan	90	50.3
Truck Dealership Loan	26	14.5
Private Loan	9	5.0
Milk Dealer Loan	3	1.7
Other	4	2.2
Total	179 1/	100.0% 1/

1/ Multiple responses were possible.

Truck Characteristics

Of the 678 vehicles reported by haulers, specific truck information was provided on 672 units. Truck information was analyzed with respect to two major characteristics. First, vehicles were classified into two major groups according to type. One group consisted of straight chassis and the other group was made up of tractor trailer units. Secondly, trucks were separated by the primary destination or function of the vehicle. Vehicles were grouped into four categories. One category was for trucks moving to upstate facilities, another was for those traveling to metropolitan New York City plants, a third was for trucks going to out-of-state facilities and the final category was for reserve vehicles.

Vehicle Type and Primary Function

Of the 672 vehicles, 402 were straight chassis trucks and 237 tractor trailer units (Table 8). For the other 33 trucks no information was provided or they were not identified as standard vehicles.

Almost 90 percent of the straight chassis had double axles. Most straight chassis (82%) delivered milk to upstate facilities.

The primary functions of tractor trailer rigs were to service Metropolitan New York City plants (44%) and out-of-state plants (25%).

Reserve vehicles were more or less equally divided between straight chassis (39) and tractor trailers (27).

A more detailed breakdown of the vehicles used for different types of hauling functions is provided in Table 9.

Type and Cost of Fuel

Over 83 percent of the vehicles operating in New York State used diesel fuel (Table 10). Thirteen percent used gasoline. No information was provided on the remaining four percent.

Almost all gasoline fueled vehicles were straight chassis, and of those being operated most were used to transport milk to upstate facilities. However, a significant proportion of the gasoline powered trucks was used as reserve vehicles.

The large proportion of diesel vehicles was surprising, especially among the straight chassis trucks. Over three-quarters of the straight chassis used diesel fuel. Not many years ago most had gasoline engines. This suggests milk haulers have been very responsive to the difference in relative prices between gasoline and diesel fuel when making their vehicle investment decisions.

Haulers were asked to indicate the most recent price paid for fuel. It should be pointed out that the question was asked in June and July 1980. The average price of gasoline was $1.24 per gallon including taxes and $1.15 per gallon excluding taxes. For diesel fuel, the average price per gallon including and excluding taxes was $1.14 and $.98, respectively.

Fuel Mileage

Information was also obtained on fuel mileage. Average mileage was 5.2 miles per gallon for both types of vehicles.

Straight chassis vehicles exhibited greater variation in fuel mileage than tractor trailers (Table 11). However, both categories averaged 5.2 miles per gallon and most vehicles obtained between 4.0 and 6.0 miles per gallon.

Table 8
Type of Chassis
New York State, 1980

Type of Chassis	Vehicle Type		Primary Destination or Function				
	Straight Chassis	Tractor Trailer	To Upstate Facility	To NYC Metro Facility	To Out-of-State Facility	Reserve	Total 1/
Single axle-straight chassis	48	0	38	0	2	7	48
Double axle-straight chassis	354	0	291	9	10	32	354
Tractor	0	237	44	105	60	27	237
Other	0	0	2	0	4	0	7
No response	0	0	0	14	0	11	26
Total	402	237	375	128	76	77	672

1/ No responses account for the differences between the sum of the vehicle types, the sum of the destinations and these totals.

Table 9
Primary Function of Vehicle
New York State, 1980

Primary Function	Vehicle Type		Primary Destination or Function				Total	1/
	Straight Chassis	Tractor Trailer	To Upstate Facility	To NYC Metro Facility	To Out-of-State Facility	Reserve		
Farm pickup to reload station	47	1	48	0	0	0	48	
Farm pickup to upstate plant	280	38	319	0	0	0	319	
Upstate plant to another upstate plant	2	5	8	0	0	0	8	
Farm pickup to metro NYC plant	6	74	0	87	0	0	87	
Upstate plant to metro NYC plant	3	31	0	41	0	0	41	
Farm pickup to out-of-state-plant	11	49	0	0	64	0	64	
Upstate plant to out-of-state plant	1	11	0	0	12	0	12	
Reserve vehicle	39	27	0	0	0	77	77	
No response	13	1	0	0	0	0	16	
Total	402	237	375	128	76	77	672	

1/ No responses account for the differences between the sum of the vehicle types, the sum of the destinations and these totals.

Table 10
Type of Fuel Used by Vehicles
New York State, 1980

Fuel Type	Vehicle Type		Primary Destination or Function				Total 1/
	Straight Chassis	Tractor Trailer	To Upstate Facility	To NYC Metro Facility	To Out-of-State Facility	Reserve	
Gasoline	83	2	59	1	4	15	85
Diesel	319	235	316	113	72	50	560
No response	0	0	0	14	0	12	27
Total	402	237	375	128	76	77	672

1/ No responses account for the differences between the sum of the vehicle types, the sum of the destinations and these totals.

Table 11
Fuel Mileage of Vehicles
New York State, 1980

Miles Per Gallon	Vehicle Type		Primary Destination or Function				
	Straight Chassis	Tractor Trailer	To Upstate Facility	To NYC Metro Facility	To Out-of-State Facility	Reserve	Total 1/
0 - 3.0	8	3	9	1	0	1	11
3.1 - 4.0	67	5	60	0	3	8	72
4.1 - 5.0	98	101	107	47	26	14	202
5.1 - 6.0	174	122	155	61	45	32	299
6.1 - 7.0	28	1	27	0	0	2	29
7.1 - 8.0	7	1	5	0	0	3	8
Over 8.0	1	0	1	0	0	0	1
No response	19	4	11	19	2	17	50
Total	402	237	375	128	76	77	672
Average	5.2	5.2	5.2	5.2	5.2	5.2	5.2

1/ No responses account for the differences between the sum of the vehicle types, the sum of the destinations and these totals.

One might expect that the trucks with the poorest fuel mileage would be used as reserve vehicles. But this was not the case. Those with the lowest fuel mileage were used to transport milk to upstate facilities. A possible explanation is that it is primarily the large haulers that maintain reserve vehicles and if a vehicle obtains poor mileage they sell it rather than keep it in reserve.

Age of Vehicles

The average age of all vehicles operating in New York State was 4.6 years (Table 12).

Straight chassis exhibited the greatest variation in age. Their average age was 5.3 years. The average age of tractors was 3.8 years.

As would be expected the newest equipment is used to transport milk to metropolitan New York City. Its average age was 3.0 years. Reserve vehicles consisted of older rolling stock. The average age of reserves was 6.9 years.

When asked how long they expected to keep existing vehicles, the average response for all vehicles was 7.5 years (Table 12). The average estimated useful life of straight chassis was 8.0 years and for tractor trailers it was 6.8 years.

One would anticipate that the average age of vehicles would be about one-half the expected useful life of those vehicles. The average age was greater than one-half the expected useful life for both straight chassis (5.3 years versus 8.0 years) and tractor trailers (3.8 years versus 6.8 years). This suggests that haulers may be keeping vehicles longer than they initially anticipated. One reason for this is that as the price of vehicles increases, haulers keep vehicles longer by investing in repairs and maintenance instead of new vehicles.

Cost of Vehicles

Haulers were asked to estimate the cost of their vehicles when they were first purchased new. A following question asked them to estimate the replacement cost of that vehicle in the summer of 1980.

Naturally, original and replacement costs varied with type of vehicle (Table 13). For straight chassis, the original and replacement costs were $28,500 and $45,200, respectively. For tractors they average $37,400 and $49,400, respectively.

Tank Age

The average age of tanks was found to be 7.2 years (Table 14). The age of straight chassis tanks was 8.9 years, while that of tractor trailer tanks was 4.9 years.

Tanks on vehicles moving to metropolitan NYC had the lowest average age (4.0 years). Surprisingly, the average age of tanks on reserve vehicles was identical to that of trucks hauling to upstate facilities and less than the average for all straight chassis.

Table 12
Age of Vehicles in Years
New York State, 1980

Age in Years	Vehicle Type		Primary Destination or Function				
	Straight Chassis	Tractor Trailer	To Upstate Facility	To NYC Metro Facility	To Out-of-State Facility	Reserve	Total 1/
0 - 1	62	69	64	42	17	7	133
2 - 3	76	74	82	34	24	9	153
4 - 5	75	18	74	10	3	2	94
6 - 7	89	27	79	10	15	13	117
8 - 9	47	25	37	5	9	19	72
10-11	22	8	15	1	6	8	30
12-13	10	8	8	5	0	5	18
14-19	6	1	5	0	0	2	7
20 & over	2	0	2	0	0	0	2
No response	13	7	9	21	2	12	46
Total	402	237	375	128	76	77	672
Average Age	5.3	3.8	5.0	3.0	4.3	6.9	4.6
Average Expected Useful Life	8.0	6.8	7.9	6.4	7.8	8.8	7.5

1/ No responses account for the differences between the sum of the vehicle type, the sum of the destinations and these totals.

Table 13
Original Costs and Replacement Costs of Straight Chassis and Tractors
New York State, 1980

Cost ($)	Straight Chassis		Tractor Trailer	
	Original Cost	Replacement Cost	Original Cost	Replacement Cost
0 - 10,000	11	1	1	0
10,100 - 20,000	74	14	10	1
20,100 - 30,000	101	33	43	1
30,100 - 40,000	56	30	51	6
40,100 - 50,000	42	204	70	152
50,100 - 60,000	10	60	13	48
60,100 - 70,000	2	19	1	1
70,100 - 80,000	0	0	1	1
Over 80,000	0	1	0	1
No response	106	40	47	26
Total	402	402	237	237
Average Cost	$28,500	$45,200	$37,400	$49,400

Table 14
Tank Age in Years
New York State, 1980

Tank Age -(In Years)	Vehicle Type		Primary Destination or Function				
	Straight Chassis	Tractor Trailer	To Upstate Facility	To NYC Metro Facility	To Out-of-State Facility	Reserve	Total 1/
0 - 1	24	47	29	27	15	3	76
2 - 3	38	62	45	46	11	7	109
4 - 5	35	29	42	11	9	10	72
6 - 7	51	18	45	8	10	9	72
8 - 9	70	11	52	12	8	8	83
10 - 11	56	13	47	4	6	15	74
12 - 13	18	6	17	2	2	3	24
14 - 19	28	10	20	2	8	7	38
20 and over	9	4	9	1	1	1	13
No response	73	37	69	15	6	14	111
Total	402	237	375	128	76	77	672
Average Age	8.9	4.9	8.2	4.0	6.2	8.2	7.2
Years Expected Useful Life	11.8	10.9	11.7	9.7	11.2	12.5	11.4

1/ No responses account for the differences between the sum of the vehicle types, the sum of the destinations and these totals.

Haulers indicated they planned to keep their tanks an average of 11.4 years (Table 14). Tanks on straight chassis were expected to have a useful life of 11.8 years, while those on tractor trailers were estimated to have a useful life of 10.9 years. Like vehicles, the average age of tanks (8.9 years) on straight chassis was greater than one-half the average expected useful life (11.8 years). However, for trailer tanks, the average age (4.9 years) was less than one-half the expected useful life (10.9 years). This probably was due to the increased purchase of tractor trailers in recent years.

Tank Capacity

Tank capacity varied considerably among vehicles (Table 15). Straight chassis exhibited the widest variation in tank size but the majority had a capacity of 4,000-4,999 gallons. On the other hand, nearly all tank trailers had a capacity of about 6,000 gallons.

Tank Costs

Haulers indicated the original cost of tanks on straight chassis averaged $13,200 (Table 16). They estimated the average cost to replace those tanks today to be $19,900. For tanks on trailers the estimate of average original and replacement costs were $26,200 and $37,000, respectively. However, it should be noted that several respondents did not venture to answer this question.

If the average age of tanks for which cost information was provided was equal to the average age of all tanks - that is 8.6 years for straight chassis and 4.9 years for trailer tanks - the data indicate tank costs for straight chassis, have increased approximately 6 percent per year and 8 percent per year for tank trailers. These figures seem reasonable, if not a little conservative particularly considering the rapid increase in tank costs in recent years.

Wage Rates of Hired Drivers

Operators hiring drivers were asked to indicate the wage rate paid drivers. Rates varied from less than $4.00 per hour to over $8.00 per hour (Table 17). The average rate was $5.32 per hour.

Table 17
Average Hourly Wage Rate Paid Hired Drivers
New York State, 1980

Wage Rate Per Hour	Number of Firms	Percent of Responses
Less than $4.00	5	4.9%
4.00 - 4.99	25	24.5
5.00 - 5.49	41	40.2
5.50 - 5.99	16	15.7
6.00 - 6.99	2	2.0
7.00 - 7.99	9	8.8
Over $.8.00	4	3.9
Total	102	100.0%

Table 15
Tank Capacity in Gallons
New York State, 1980

Tank Capacity (Gallon)	Vehicle Type		Primary Destination or Function				
	Straight Chassis	Tractor Trailer	To Upstate Facility	To NYC Metro Facility	To Out-of-State Facility	Reserve	Total 1/
0 - 3,499	56	1	42	0	2	13	58
3,500 - 3,749	79	0	65	0	2	10	79
3,750 - 3,999	38	1	28	0	1	5	39
4,000 - 4,499	208	4	181	9	6	12	212
4,500 - 4,999	16	1	14	1	3	0	18
5,000 - 5,499	4	7	5	0	5	4	15
5,500 - 5,999	0	58	15	28	18	5	66
6,000 and over	0	148	22	80	37	18	157
No response	1	17	3	10	2	10	28
Total	402	237	375	128	76	77	672

1/ No responses account for the differences between the sum of the vehicle types, the sum of the destinations and these totals.

Table 16
Original Costs and Replacement Costs of Tanks
New York State, 1980

Cost ($)	Straight Chassis		Tractor Trailer	
	Original Cost	Replacement Cost	Original Cost	Replacement Cost
0 - 5,000	5	1	1	0
5,100 -10,000	56	5	5	0
10,100 -15,000	128	20	15	0
15,100 -20,000	51	191	33	1
20,100 -25,000	15	69	13	10
25,100 -30,000	0	2	38	5
30,100 -35,000	0	0	46	24
35,100 -40,000	0	13	28	138
Over 40,000	0	0	0	2
No response	147	101	58	57
Total	402	402	237	237
Average	$13,200	$19,900	$26,200	$37,000

The Efficiency of Milk Hauling

The major way to improve the financial health of the NYS milk hauling industry is to improve efficiency. But with respect to transportation, efficiency is a difficult concept. For example, efficiency can be improved by giving each hauler a regional monopoly over farm pickup. But such a system conflicts with farmer-dealer relationships and could lead to increased costs due to lack of competition.

Six measures of efficiency were studied in the survey. They were:

1) Percent of every day pickups per hauler
2) Average number of loads per day
3) Average number of farm stops per day
4) Average pounds of milk hauled per day
5) Average number of miles traveled per day, and
6) Average number of hours on the road per day

For the latter four measures, information was collected on each vehicle for two consecutive weekdays. The information was averaged and is presented on a "per day" basis.

Every Day Pickups

One way to improve hauling efficiency is to switch from every day pickups to every other day pickups. Haulers were asked to estimate the percent of their farm stops that were every day pickups. The results appear in Table 18.

Table 18
Proportion of Every Day Pickups
New York State, 1980

Percent Every Day Pickup	Number of Haulers	Percent of Haulers
0%	28	18.7%
1 - 10	50	33.3
11 - 30	31	20.6
31 - 50	22	14.7
Over 50%	9	6.0
Unknown	10	6.7
Total	150	100.0%

Haulers and dealers have done a reasonably good job of reducing the number of every day pickups. Over 52 percent of the haulers had less than 10 percent of their stops as every day pickups. For all haulers the average proportion of every day pickups was 18.2 percent.

Number of Daily Loads

Vehicles typically made one or two loads per day (Table 19). The average number of loads for all trucks was 1.5 per day. While straight chassis exhibit considerable variation in the number of loads per day, several haul two loads per day. However, a significant portion make only one load per day. They averaged 1.8 loads per day. The majority of tractor trailers hauled one load per day, and their average was 1.1 per day.

Table 19
Average Number of Loads Per Day
New York State, 1980

Average Number of Loads	Vehicle Type		Primary Destination or Function				
	Straight Chassis	Tractor Trailer	To Upstate Facility	To NYC Metro Facility	To Out-of-State Facility	Reserve	Total 1/
4 or more loads per day	8	0	8	0	0	0	8
3 loads per day	36	1	34	1	1	0	37
2 loads per day	133	16	136	9	2	0	151
3 loads every 2 days	60	23	65	14	4	0	83
1 load per day	87	165	101	101	67	0	271
2 loads every other day	10	1	5	0	1	0	11
No loads, Reserve	42	28	4	1	0	76	81
Other	22	2	19	2	1	1	24
No response	4	1	3	0	0	0	6
Total	402	237	375	128	76	77	672
Average	1.8	1.1	1.7	1.1	1.1	0.0	1.5

1/ No responses account for the differences between the sum of the vehicle types, the sum of the destinations and these totals.

Average Number of Farm Stops

All trucks averaged 14.2 farm stops per day (Table 20). Straight chassis and tractor trailers averaged 14.4 and 13.7 stops, respectively. Straight chassis vehicles have more stops per day because on average they pick up less milk per stop and haul more loads per day.

Pounds of Milk Hauled Per Day

All vehicles hauled an average of 49,800 pounds per day (Table 21). With respect to average quantity hauled there was surprisingly little variation between the different types of vehicles and destinations.

Straight chassis averaged 47,700 pounds per day, while that for tractor trailers was 53,300 pounds. Although trucks moving to metropolitan NYC facilities carried more milk per day it was not significnatly more than vehicles going to upstate and out-of-state facilities.

Total Miles Per Day

All vehicles traveled an average of 216 miles per day (Table 22). Tractor trailers drive over twice as far as straight chassis vehicles - 346 compared to 139 miles per day.

Trucks moving milk into the NYC metropolitan area average 423 miles per day. Those traveling to out-of-state plants averaged 281 miles, and those operating in upstate NYS 142 miles per day.

Hauling Hours Per Day

For all trucks, the average time from the garage to the garage was 11.2 hours (Table 23). For straight chassis trucks it was 9.3 hours and for tractor trailers 14.4 hours.

Vehicles moving milk to metropolitan NYC spend the most time on the road - 15.4 hours. But even this is probably much less time than is necessary to make efficient use of vehicles. Utilization was significantly lower for trucks moving milk to upstate and out-of-state facilities.

The largest cost component for milk haulers is the cost of the vehicle. Table 23 suggests most vehicles are being used only a fraction of the day. Consequently, probably the best strategy to increase efficiency and reduce hauling costs is to increase truck utilization.

Summary

Milk hauling in New York State is indeed a transportation intensive industry. The average vehicle travels 216 miles per day. In so doing, it completes one and a half loads per day, stops at fourteen farms, spends about 11.2 hours on the road and carries 49,800 pounds of milk. These are average figures for all trucks operating in the state, and there is considerable variation between different types of vehicles as well as those with different destinations.

All parties have a vested interest in making sure that the hauling system operates as efficiently as possible. The key to improving efficiency is increased utilization of the truck, labor and fuel. And every segment of the dairy industry must do its part to assist in this effort.

Table 20
Average Number of Farm Stops Per Day
New York State, 1980

Average Number of Farm Stops	Vehicle Type		Primary Destination or Function					
	Straight Chassis	Tractor Trailer	To Upstate Facility	To NYC Metro Facility	To Out-of-State Facility	Reserve	Total	1/
0	42	68	7	32	9	75	122	
1 - 5	21	3	19	0	3	0	24	
6 - 7	9	5	13	0	1	0	14	
8 - 9	21	7	21	2	4	0	29	
10 -11	34	21	37	10	10	0	58	
12 -13	45	37	46	24	16	0	86	
14 -15	33	39	36	18	18	0	73	
16 -17	46	12	45	11	4	0	60	
18 -19	37	9	36	8	1	0	47	
20 -24	34	6	35	3	3	0	41	
Over 24	17	6	22	0	0	0	23	
No response	63	24	58	20	7	2	95	
Total	402	237	375	128	76	77	672	
Average	14.4	13.7	14.6	14.0	12.4	-	14.2	

1/ No responses account for the differences between the sum of the vehicle types, the sum of the destinations and these totals.

Table 21
Average Pounds of Milk Hauled Per Day
New York State, 1980

Pounds of Milk	Vehicle Type		Primary Destination or Function				
	Straight Chassis	Tractor Trailer	To Upstate Facility	To NYC Metro Facility	To Out-of-State Facility	Reserve	Total 1/
0	40	27	3	1	0	73	78
100 - 20,000	23	1	21	1	1	1	24
20,100 - 40,000	97	8	88	9	7	1	107
40,100 - 60,000	111	157	125	86	58	0	278
60,100 - 80,000	61	14	64	10	1	0	76
80,100 - 100,000	21	4	23	1	1	0	25
Over 100,000	3	7	7	4	0	0	11
No response	46	19	44	16	8	2	73
Total	402	237	375	128	76	77	672
Average	47,700	53,300	49,700	52,700	47,100	-	49,800

1/ No responses account for the differences between the sum of the vehicle types, the sum of the destinations and these totals.

Table 22
Average Number of Miles Traveled Per day
New York State, 1980

Per Day	Vehicle Type: Straight Chassis	Vehicle Type: Tractor Trailer	Primary Destination or Function: To Upstate Facility	To NYC Metro Facility	To Out-of-State Facility	Reserve	Total	1/
0	40	26	3	1	0	72	77	
1 - 50	21	1	20	1	0	1	22	
51 - 100	73	12	76	5	4	0	86	
101 - 150	102	21	108	5	9	0	124	
151 - 200	75	17	71	4	10	0	93	
201 - 250	20	10	21	3	6	0	30	
251 - 300	9	11	11	1	8	0	20	
301 - 350	3	5	2	1	5	0	8	
351 - 400	2	20	0	5	16	0	22	
401 - 450	1	15	5	7	4	0	16	
451 - 500	1	38	3	33	4	0	40	
Over 500	1	30	0	30	1	0	31	
No response	54	31	55	32	9	4	103	
Total	402	237	375	128	76	77	672	
Average	139	346	142	423	281	-	216	

1/ No responses account for the differences between the sum of the vehicle types, the sum of the destinations and these totals.

Table 23
Average Number of Hours Operated Per Day
New York State, 1980

Hours Per Vehicle Per Day	Vehicle Type		Primary Destination or Function				
	Straight Chassis	Tractor Trailer	To Upstate Facility	To NYC Metro Facility	To Out-of-State Facility	Reserve	Total 1/
0	40	26	3	1	0	72	77
1 - 5	25	1	23	1	1	1	26
6 - 7	26	7	30	2	1	0	33
8 - 9	105	19	106	4	8	0	126
10 -11	93	15	92	1	14	0	109
12 -13	37	35	37	22	13	0	73
14 -15	13	32	13	23	15	0	51
16 -17	5	22	4	16	6	0	27
18 -19	4	16	4	8	8	0	20
20 -24	0	33	9	22	3	0	34
No response	54	31	54	28	7	4	96
Total	402	237	375	128	76	77	672
Average	9.3	14.4	9.6	15.4	13.1	-	11.2

1/ No responses account for the differences between the sum of the vehicle types, the sum of the destinations and these totals.

SECTION III

ANALYSIS OF THE RESULTS BY REGIONS

There was reason to believe that the structure and characteristics of the milk hauling industry in New York State differed from region to region. Based on milk utilization, geographic considerations and the federal and state milk marketing orders, New York State was divided into the following seven regions (also see Figure 1):

Region 1 - Southwestern NY
Region 2 - Western NY
Region 3 - Northern NY
Region 4 - South Central NY
Region 5 - Mohawk Valley
Region 6 - Southeastern NY
Region 7 - Hudson Valley

Milk in Southwestern NY (Region 1) moves primarily to manufacturing plants in the region. A significant proportion of the milk in Western NY (Region 2) is covered by the two state milk marketing orders and is marketed in the Buffalo and Rochester areas. Northern NY (Region 3) is the location of several manufacturing facilities, mainly cheese plants, and much of the milk produced in this region is used by these facilities. A large share of the milk produced in South Central NY (Region 4), the Mohawk Valley (Region 5), and Southeastern NY (Region 6) is covered under the New York-New Jersey Federal Milk Marketing Order. A significant portion moves into bottling plants in the New York metropolitan area. A substantial amount of the milk produced in the Hudson Valley (Region 7) is shipped into New England.

Haulers were asked to indicate all counties within which they have at least one farm stop. Regional data were constructed based on the county information. All vehicles for each hauler were included when analyzing the seven regions since no attempt was made to ascertain which counties each truck served. When a hauler operated in two or more regions all his trucks were included the analysis of those regions. Consequently, several vehicles are included more than once. Since all the trucks of a hauler may not be operating in the region in question, the term "available" vehicles is used. The method of aggregation should be kept in mind when interpreting the data, since it may have an impact on the results.

Number of Vehicles

The number of straight chassis vehicles and tractor trailers available in each region is given in Table 24. (Table B1 in Appendix B indicates the number of haulers and the number of vehicles operating in each county in New York State.) Western NY had the largest number of straight chassis with 160 used on a full-time basis. Most tractor trailers operating year around were in the Federal Order No 2 area, i.e. South Central NY (68), the Mohawk Valley (93) and Southeastern NY regions (96).

FIGURE I. MILK HAULING REGIONS IN NEW YORK STATE

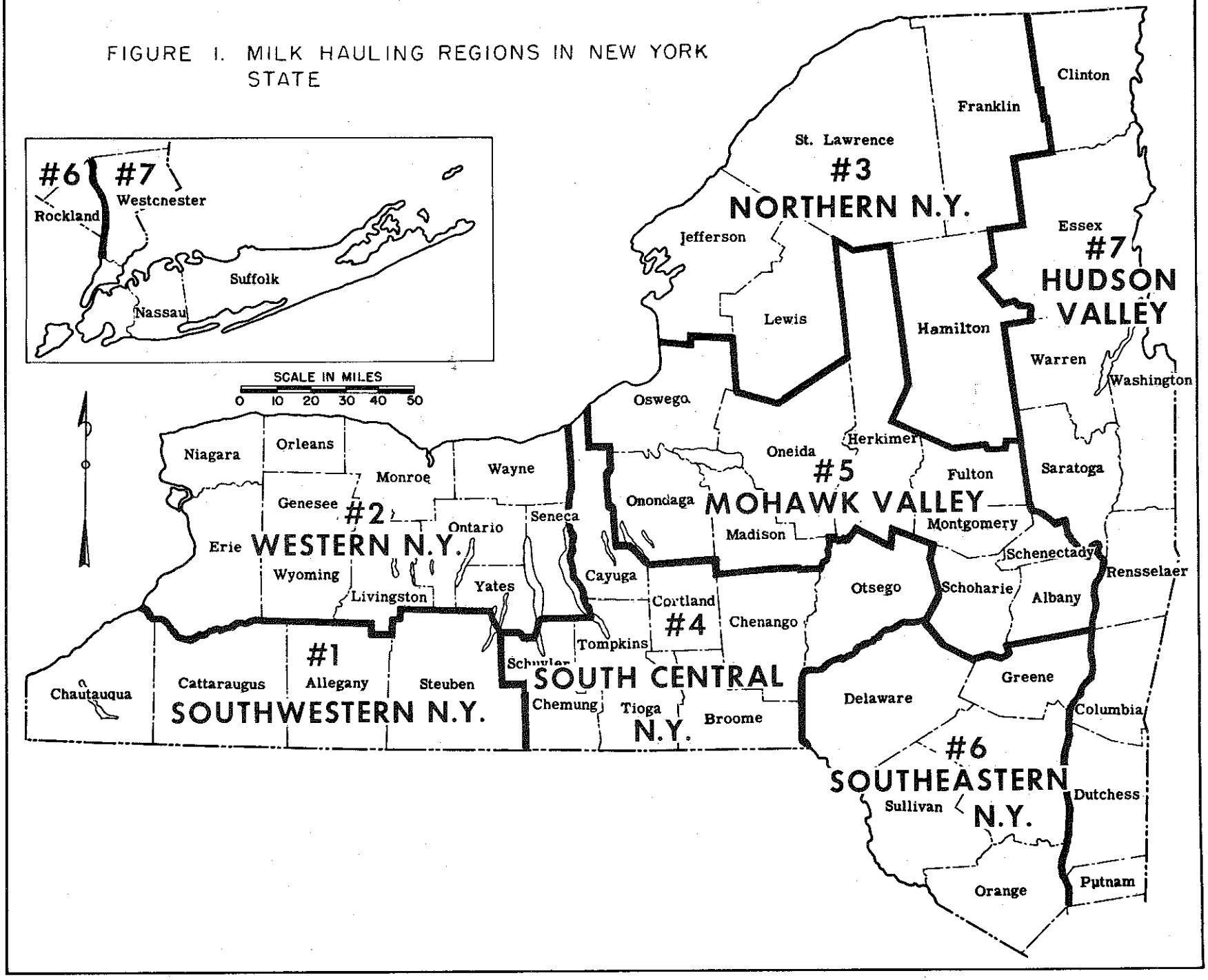

Table 24
Number of Straight Chassis and Tractor Trailers by Region
New York State, 1980

Region	Available Straight Chassis		Available Tractor Trailers				Total Available 1/ Power Units
			Power Units		Tanks		
	Year Around	Reserve Vehicle	Year Around	Reserve Vehicles	Year Around	Reserve Tanks	
1 - Southwestern NY	125	12	19	2	15	2	158
2 - Western NY	160	14	24	4	19	3	202
3 - Northern NY	68	9	18	1	18	1	96
4 - South Central NY	109	16	68	9	72	5	202
5 - Mohawk Valley	110	21	93	14	98	23	238
6 - Southeastern NY	44	10	96	19	94	27	169
7 - Hudson Valley	38	10	60	10	60	16	118
New York State 2/	388	52	207	31	213	36	678

1/ Includes year around and reserve straight chassis and tractor power units

2/ The actual number operating in the state. The sum of the regional data is greater than the state total because several vehicles operate in more than one region

However, the Hudson Valley also had a substantial number of tractor trailers (60). Available trailer tanks were closely correlated with the number of tractors. The number of reserve power units varied directly with the number of year around power units. Most regions avaraged one reserve vehicle for every six or seven year around vehicles.

The number of haulers and power units available were compared with the number of dairy farms and the amount of milk produced in each region (Table 25). The number of haulers varied from 46 in Western NY to 16 in Southeastern NY. Average dairy farms per hauler ranged from 112 in South Central NY to 58 in Western NY. Milk production per hauler exhibited a similar pattern and varied from 64.7 million pounds in South Central NY to 37.8 million pounds in Western NY. The number of dairy farms per truck varied from a low of 8 in Southeastern NY to a high of 31 farms per truck in Northern NY. Again milk production per truck was correlated directly with the number of farms per truck. The data for Southeastern NY are probably not an accurate indication of the structure of the industry in that region because the number of trucks is biased by large haulers with vehicles operating solely or primarily in other regions.

One possible explanation for the pattern in the number of farms and amount of milk production per hauler and per truck is the density of milk production in each region. Consequently, milk production per acre of cropland was computed for each region (Table 25). This seems to partially explain the hauling characteristics in Western NY, but does not appear to be a factor in the other regions. In Western NY the diverse nature of agricultural production may be one cause of the low number of farms and amount of milk per hauler and per truck.

The number of power units per hauler varied from 2.5 in Northern NY to 10.6 in Southeastern NY. The data presented below suggests Northern NY has a rather efficient milk hauling system. While there is no reason to believe it is caused by the number of trucks per hauler, some relationship may exist.

In Table 25 the state averages are usually higher than the averages for each region. This is due to including some vehicles in two or more regions.

Primary Functions

The primary function of straight chassis vehicles in each region is presented in Table 26. Farm pickup to reload stations is most common in Southeastern NY where 28 percent of the available straight chassis handled milk in this manner. Approximately 90 percent of the straight chassis in Northern NY and Western NY moved milk from the farm to an upstate plant. Direct delivery to a New York metropolitan plant by a straight chassis vehicle was practiced only in Southeastern NY and the Hudson Valley. This is due to the nearness of these regions to New York City. The only movement of milk from the farm to an out-of-state plant by straight chassis was found in Southwestern NY, where some vehicles were delivering milk to Pennsylvania. Very few straight chassis vehicles were involved in plant to plant movements of milk on a regular basis. Reserve vehicles varied from a low of 6 percent in Northern NY to 20 percent in Southeastern NY.

Table 25
Milk Production and Hauling Characteristics by Region
New York State, 1980

Item	#1 Southwestern NY	#2 Western NY	#3 Northern NY	#4 South Central NY	#5 Mohawk Valley	#6 Southeastern NY	#7 Hudson Valley	NY State
Dairy Farms 1/	2,332	2,689	3,010	3,240	3,557	1,382	1,971	18,181
Milk Prod. (1. Mil. Lbs.) 2/	1,143	1,737	1,608	1,878	2,006	780	1,234	10,386
Available Haulers	29	46	38	29	32	16	32	150 3/
Dairy Farm/Hauler	80	58	79	112	111	86	62	121
1,000 Lbs. Milk Prod./Hauler	39,400	37,800	42,300	64,700	62,700	48,800	38,600	69,200
Available Power Units	158	202	96	202	238	169	118	678 3/
Dairy Farms/Power Unit	15	13	31	16	15	8	17	27
1,000 Lbs. Milk Prod/Power Unit	7,200	8,600	16,700	9,300	8,400	4,600	10,500	15,400
Milk Prod./Acre Cropland 1/	1,600	1,100	2,200	2,100	2,000	2,100	2,000	1,800
1000 Lbs Milk Prod./Farm	490	646	534	580	564	565	626	571
Power Units/Hauler	5.4	4.4	2.5	7.0	7.4	10.6	3.7	4.5

1/ Data on number of dairy farms and acres of cropland was taken from Bureau of the Census, 1978 Census of Agriculture: New York (Preliminary Report) (Washington, D. C.: U.S. Department of Commerce, 1980).

2/ Dairy Industry Services, New York State Dairy Statistics - 1979 Annual Summary, (Albany: NYS Department of Agriculture and Market, 1980).

3/ Indicates the actual number operating in the state. The sum of the regional data is greater than the state total because several vehicles operate in more than one region.

Table 26
Primary Hauling Function of Straight Chassis Vehicles by Region 1/
New York State, 1980

Primary Function	#1 Southwestern NY	#2 Western NY	#3 Northern NY	#4 South Central NY	#5 Mohawk Valley	#6 Southeastern NY	#7 Hudson Valley	NY State
Farm Pickup to Reload Station	4.8%	2.5%	3.7%	16.3%	17.1%	28.0%	20.0%	12.1%
Farm Pickup to Upstate Plant	84.8	88.8	90.1	69.9	67.4	34.0	58.0	72.0
Farm Pickup to Metro NYC Plant	0.0	0.0	0.0	0.0	0.0	12.0	4.0	1.5
Farm Pickup to Out-of-State Plant	3.2	0.0	0.0	1.6	1.5	6.0	0.0	2.8
Upstate Plant to Upstate Plant	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Upstate Plant to Metro NYC Plant	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.8
Upstate Plant to Out-of-State Plant	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.3
Reserve or Backup Vehicle	7.2	7.5	6.2	12.2	14.0	20.0	18.0	10.0
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Number Vehicles	125	160	81	123	129	50	50	389

1/ All vehicles for haulers operating in more than one region were included in each applicable region.

The primary functions of available tractor trailers by region is provided in Table 27. Only one vehicle, operating in the western portion of the state, picked up milk and delivered it to a reload station. Direct delivery to an upstate plant was the primary role of 60 percent of the tractor trailers in Southwestern NY, 69 percent of the rigs in Western NY, and 79 of the tractors in Northern NY.

Tractor trailers operating in Federal Order No. 2 were primarily used for direct delivery of milk to plants in the New York City metropolitan area. In South Central NY 58 percent of the vehicles were used for this purpose, while in the Mohawk Valley and Southeastern NY the proportion was 40 percent. The closer the region to New England the higher the percent of tractor trailers used to ship milk to an out-of-state plant. For example, in Southeastern NY, 30 percent of the tractors hauled milk directly from the farm to an out-of-state plants while 8 percent were used for out-of-state transfers from upstate plants. In the Hudson Valley region nearly 60 percent of the tractor trailers delivered to an out-of-state plant, while another 11 percent were used for shipments from an upstate plant to out-of-state plants. The proportion of reserve tractor trailers was rather evenly distributed over all regions. The exception was Northern NY where there were no reserve tractor trailers.

Vehicle and Tank Characteristics

Straight Chassis

The vehicle and tank characteristics of straight chassis available in the various regions is presented in Table 28. The table separates information on the power unit (the chassis) from data on the tank.

The average initial cost of the chassis ranged from a high of $34,500 in Southwestern NY to a low of $25,500 in Southeastern NY. Vehicle age and horsepower seems to explain some of the difference in initial costs. In Southwestern NY straight chassis power units were newer and had a somewhat higher horsepower than vehicles in the other regions. Age was the primary reason for the low initial cost of chassis in Southeastern NY. In general, the regions with the newest vehicles had the lowest average horsepower and the highest fuel mileage.

The initial cost of tanks on straight chassis vehicles ranged from $14,700 in the Mohawk Valley to $12,700 for tanks used in the Hudson Valley. Average age of tanks explains some of this variation.

Tractor Trailers

Power unit and tank information for available tractor trailers by region are also provided in Table 28. The initial cost of tractors varied between $43,700 in South Central NY to $33,300 in the Hudson Valley. Again, age and horsepower appear to explain a substantial portion of the variation in initial cost. Average age of tractors was the lowest (2.1 years) in South Central NY and the highest (4.6 years) in the Hudson Valley. Horsepower varied from 244 in Northern NY to 329 in Southwestern NY. Fuel mileage exhibited no systematic pattern between regions.

The average initial cost of trailer tanks varied from $29,800 in South Central NY to $23,900 in the Hudson Valley. Again, tank age was apparently a major determinant of the initial cost of tanks.

Table 27
Primary Hauling Function of Tractor Trailers by Region 1/
New York State, 1980

Primary Function	#1 Southwestern NY	#2 Western NY	#3 Northern NY	#4 South Central NY	#5 Mohawk Valley	#6 Southeastern NY	#7 Hudson Valley	NY State
Farm Pickup to Reload Station	5.0%	3.9%	0.0%	1.3%	0.0%	0.0%	0.0%	0.4%
Farm Pickup to Upstate Plant	60.0	69.2	78.9	19.2	17.3	0.9	11.3	16.1
Upstate Plant to Other Upstate Plant	10.0	7.7	5.3	3.8	0.9	0.0	0.0	2.1
Farm Pickup to Metro NYC Plant	0.0	0.0	15.8	57.8	40.0	40.2	4.2	31.4
Upstate Plant to Metro NYC Plant	0.0	0.0	0.0	0.0	4.5	6.8	4.2	13.1
Farm Pickup to Out-of-State Plant	5.0	0.0	0.0	5.1	17.3	29.9	59.2	20.8
Upstate Plant to Out-of-State Plant	10.0	7.7	0.0	3.8	8.2	7.7	11.3	4.7
Reserve Vehicle	10.0	11.5	0.0	9.0	11.8	14.5	9.8	11.4
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Number Vehicles	20	26	19	78	110	117	71	236

1/ All vehicles for haulers operating in more than one region were included in each applicable region.

Table 28
Vehicle and Tank Characteristics by Region 1/
New York State, 1980

Region	Power Unit				Tank	
	Initial Cost	Age (Years)	Horsepower	Miles (Per Gal.)	Initial Cost	Age (Years)
			Straight Chassis Vehicles			
1 - Southwestern NY	$34,500	4.8	254	5.1	$13,300	10.2
2 - Western NY	29,900	4.8	245	5.3	13,900	9.5
3 - Northern NY	27,300	4.7	237	5.5	12,800	8.4
4 - South Central NY	29,800	5.5	251	5.4	14,300	7.2
5 - Mohawk Valley	27,300	5.9	249	5.3	14,700	8.0
6 - Southeastern NY	25,500	7.9	260	4.9	13,300	8.9
7 - Hudson Valley	27,600	4.8	231	5.1	12,700	8.8
New York State	$28,500	5.3	245	5.2	13,200	8.9
			Tractor Trailers			
1 - Southwestern NY	$40,100	3.7	329	5.0	$27,700	4.1
2 - Western NY	39,800	3.5	306	5.2	29,600	5.1
3 - Northern NY	37,800	3.3	244	4.7	28,400	4.2
4 - South Central NY	43,700	2.1	281	5.2	29,800	3.0
5 - Mohawk Valley	38,700	3.4	285	5.3	27,400	3.8
6 - Southeastern NY	36,300	4.2	287	5.3	25,300	4.9
7 - Hudson Valley	33,300	4.6	286	5.0	23,900	7.0
New York State	$37,400	3.8	286	5.2	26,200	4.9

1/ All vehicles for the haulers operating in more than one region were included in each applicable region.

The distribution of tank sizes across regions is illustrated in Table 29. Tanks on straight chassis vehicles were smallest in the Hudson Valley, Northern NY and Western NY. For tractor trailers the smallest tanks were found in Western NY, Southwestern NY and the Hudson Valley.

The Efficiency of Milk Hauling By Region

Table 30 indicates how milk hauling efficiency varied across the seven regions.

Straight Chassis

For straight chassis vehicles, Southeastern NY had the fewest (1.55) loads per day. However, Western NY and Southern NY were close with 1.59 and 1.61 loads per day, respectively. Straight chassis in the Hudson Valley had the highest number (2.17) of loads per day, while Northern NY had 2.11 loads per day.

The average number of farm stops per day ranged from 12.9 in Western NY to 18.5 in Northern NY. Average amount of milk hauled per vehicle reflects the combination of number of farm stops per day and loads per day. Trucks in Southeastern NY hauled the fewest pounds of milk per day (41,000 lbs.) while those in Northern NY hauled the most (60,500 lbs.). In general straight chassis traveled between 140 and 150 miles per day, except in Southeastern NY and the Hudson Valley where average daily mileage was somewhat less - 134 and 122 miles respectively. Average hours of operation for straight chassis ranged from 8.6 hours per day in Western NY to 10.5 hours per day in Southeastern NY.

In general the indicators suggest the hauling efficiency of straight chassis is highest in Northern NY and lowest in Western NY.

Tractor Trailers

Efficiency indicators for tractor trailers are also shown in Table 30.

Loads per day averaged between 1.37 in Northern NY to 1.08 in Southeastern NY. The average number of farm stops ranged from 17.7 in Northern NY to 11.1 in Western NY. Again the combination of the number of loads and number of farm stops per day has an effect on the amount of milk hauled. Average pounds of milk handled per day by tractor trailers was highest in Northern NY (67,600 lbs.) and lowest in Southwestern NY (46,800 lbs.).

The fact that tractor trailers in the western and northern portion of the state are serving upstate plants is indicated by average daily mileage. Tractors in these regions travel fewer miles per day than do tractors operating in the other regions. Tractor trailers operating in the Federal Order regions averaged between 369 and 402 miles per day while those in the western and northern portion of the state traveled an average of between 153 and 264 miles per day. Tractor trailers in most regions operated between 14.0 and 17.9 hours per day. The exceptions were those operating in Western NY and Southwestern. Tractors in those regions operated 9.2 and 10.2 hours per day, respectively.

Table 29
Tank Capacity by Region 1/
New York State, 1980

Tank Capacity (Gallons)	#1 Southwestern NY	#2 Western NY	#3 Northern NY	#4 South Central NY	#5 Mohawk Valley	#6 Southeastern NY	#7 Hudson Valley	NY State
				Tanks on Straight Chassis Vehicles				
Less than 3500	2.3%	8.7%	21.0%	5.6%	7.6%	1.9%	29.5%	14.0%
3500 - 3749	18.8	19.1	30.9	14.3	20.6	26.9	7.8	19.7
3750 - 3999	4.7	9.9	8.6	6.3	6.9	0.0	23.5	9.5
4000 - 4499	66.4	57.4	30.9	69.0	61.1	71.2	35.3	51.9
4500 - 4999	6.2	4.3	6.1	4.0	3.0	0.0	3.9	4.0
500 and over	1.6	0.6	2.5	0.8	0.8	0.0	0.0	1.0
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Number Vehicles	128	162	81	126	131	52	51	401
				Tanks on Tractor Trailers				
Less than 5000	5.9	17.4	0.0	0.0	0.0	1.8	0.0	3.2
5000 - 5499	5.9	4.3	0.0	1.4	0.0	2.7	5.9	3.2
5500 - 5999	41.2	34.8	15.8	22.2	17.6	27.4	30.9	26.4
6000 and over	47.0	43.5	84.2	76.4	81.3	74.1	63.2	67.2
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Number Vehicles	17	23	18	72	108	112	68	220

1/ All vehicles for haulers operating in more than one region were included in each applicable region.

Table 30
Milk Hauling Efficiency by Region 1/
New York State, 1980

Region	Average Per Vehicle Per Day				
	Loads	Farm Stops	Pounds Milk	Miles Traveled	Hours
			Straight Chassis Vehicles		
1. Southwestern NY	1.61	14.1	41,700	153	9.1
2. Western NY	1.59	12.9	44,600	141	8.6
3. Northern NY	2.11	18.5	60,500	148	10.0
4. South Cental NY	1.77	13.9	51,400	150	9.8
5. Mohawk Valley	1.76	14.7	52,200	145	9.7
6. Southeastern NY	1.55	13.8	41,000	134	10.5
7. Hudson Valley	2.17	14.2	44,900	122	9.4
New York State	1.76	14.4	47,700	139	9.3
			Tractor Trailers		
1. Southwestern NY	1.22	12.3	46,800	207	10.2
2. Western NY	1.26	11.1	47,300	153	9.2
3. Northern NY	1.37	17.7	67,600	264	17.9
4. South Central NY	1.12	13.1	54,400	382	15.8
5. Mohawk Valley	1.19	15.1	58,700	369	16.6
6. Southeastern NY	1.08	13.6	52,600	402	15.9
7. Hudson Valley	1.09	13.8	54,000	286	14.0
New York State	1.14	13.7	53,300	346	14.4

1/ All vehicles for haulers operating in more than one region were included in each applicable region.

Again, in the case of tractor trailers, haulers in Northern NY appear to operate their vehicles most efficiently in terms of loads per day, milk hauled per day and hours operated per day. Conversely, the data on Western NY suggest that milk hauling efficiency in that region can be increased significantly, at least in comparison with the other regions in the state.

Summary

Hauling characteristics vary significantly between the different regions of the state. The data indicate that hauling efficiency is highest in Northern NY. Perhaps haulers in other regions of the state should study the practices and procedures used by operators in this region.

Section IV

A COMPARISON OF TRUCKS SERVING COOPERATIVE VERSUS PROPRIETARY HANDLERS

Hauling characteristics may depend on whether a hauler is serving a cooperative firm or a proprietary firm. Truck data for those hauling for cooperative dealers was compared to that for haulers working for proprietary dealers. Fifty-one haulers worked only for cooperative firms, 66 hauled only for proprietary firms and 38 handled milk for both types of dealers. The trucks of haulers working for both groups were included in the analysis of both groups.

New York State

Primary Functions

The primary functions of straight chassis vehicles did not vary significantly between cooperative firms and proprietary firms (Table 31). Straight chassis serving cooperative firms had a higher proportion of trucks moving milk from the farm to upstate plants (76% versus 72%), while those serving proprietary firms had a higher percentage of farm to reload station movements (14% versus 10%).

Tractor trailers serving cooperatives were more likely to move milk from the farm to upstate plants (17% compared to 11%) and from the farm to out-of-state plants (29% compared to 23%) than those serving proprietary firms. At the same time, tractor trailers serving proprietary firms typically had a higher proportion of vehicles providing direct delivery to New York City metropolitan plants (32% versus 24%), and moving milk from upstate plants to New York metropolitan plants (16% versus 11%) than those serving cooperative firms.

Vehicle and Tank Characteristics

The vehicle and tank characteristics for trucks serving cooperative and proprietary dealers are presented in Table 32.

The power units of straight chassis vehicles serving cooperative dealers had a somewhat higher initial cost ($29,500) than those serving proprietary firms ($27,800). Part of the difference is due to the average age of vehicles. For straight chassis serving cooperatives the average age was 4.8 years, while for trucks handling milk for proprietary dealers it was 5.5 years. Horsepower and fuel mileage were similar for both groups.

The initial cost of tanks on straight chassis trucks was $13,200 for vehicles serving cooperative dealers and $13,600 for proprietary dealers. The slight difference in initial cost was apparently due to the difference in average age of the tanks in each group.

The average initial cost, age, horsepower and fuel mileage of tractors did not vary significantly with the type of dealer being served. Tanks on tractor trailers hauling milk for proprietary dealers had a somewhat higher initial cost - $27,000 compared to $26,100. The reason seems to be the difference in the average age of the tanks.

Table 31
Primary Hauling Functions of Trucks Serving Cooperative and Proprietary Handlers 1/
New York State, 1980

Primary Function	Straight Chassis		Tractor Trailers	
	Serving Cooperative Dealers	Serving Proprietary Dealers	Serving Cooperative Dealers	Serving Proprietary Dealers
Farm Pickup to Reload Station	9.6 %	13.6 %	0.7 %	0.5 %
Farm Pickup to Upstate Plant	76.3	72.0	17.1	11.2
Upstate Plant to Other Upstate Plant	0.4	0.7	3.6	2.1
Farm Pickup to Metro NYC Plant	2.2	0.0	23.6	31.6
Upstate Plant to Metro NYC Plant	0.0	1.1	10.7	15.8
Farm Pickup to Out-of-State Plant	2.2	2.4	28.6	22.5
Upstate Plant to Out-of-State Plant	0.4	0.4	7.1	5.6
Reserve Vehicle	8.9	9.8	8.6	10.7
Total	100.0 %	100.0 %	100.0 %	100.0 %
Number Vehicles	270	286	140	196

1/ All vehicles for haulers serving both types of handlers were included in each applicable group.

Efficiency Indicators

Five measures of the efficiency for trucks serving cooperative and proprietary firms are also presented in Table 32.

The efficiency indicators for straight chassis vehicles were very similar for both groups. However, straight chassis serving cooperatives carried slightly fewer pounds of milk, but operated slightly more hours than trucks serving proprietary firms.

The indicators exhibited somewhat more variability for tractor trailers. Tractor trailers serving cooperative firms had fewer loads per day (1.1 versus 1.2), fewer farm stops per day (13.1 versus 13.8), moved less milk per day (50,900 versus 54,600), traveled fewer miles (327 versus 363) and operated fewer hours (13.5 versus 14.6) than the tractor rigs serving proprietary firms.

The measures suggest the efficiency of straight chassis vehicles does not vary significantly with the type of dealer. However, in the case of tractor trailers, those serving proprietary firms appear to be operated somewhat more efficiently than those serving cooperative firms.

New York-New Jersey Federal Milk Marketing Order Region

It was hypothesized that there would be a larger difference in the hauling efficiency of trucks serving cooperative and proprietary firms, especially for straight chassis vehicles. There is a general assumption that cooperative producers are smaller and more out-of-the-way than farmers producing milk for proprietary firms. Consequently, the hauling efficiency of vehicles serving cooperative handlers would be expected to be lower than that for vehicles serving proprietary firms. The statewide data did not confirm this hypothesis. Possible reasons include:

1) The statewide data was too aggregated and differences in efficiency is a regional phenomenon.

2) Since several haulers hauled for both cooperative and proprietary firms, and the information from their vehicles was included in both groups, the data on these haulers moderated the differences in efficiency, or

3) There is actually no difference in the performance of vehicles hauling for cooperative and proprietary firms.

It was impossible to determine the real reason for a lack of difference in the efficiency measures. However, it was thought the differences might be the largest among vehicles operating in the New York-New Jersey Federal Milk Marketing Order regions i.e. South Central NY (Region 4), the Mohawk Valley (Region 5) and Southeastern NY (Region 6). Consequently, vehicles for haulers operating in these three regions were analyzed separately.

The primary functions of straight chassis vehicles and tractor trailers exhibited the same general pattern for the Federal Order 2 regions (Table 33) as they did for the state in general. The same was true for vehicle and tank characteristics (Table 34).

Table 32
Vehicle and Tank Characteristics and Measures of Efficiency
for Trucks Serving Cooperative and Proprietary Handlers 1/
New York State, 1980

Item	Straight Chassis		Tractor Trailers	
	Serving Cooperative Dealers	Serving Proprietary Dealers	Serving Cooperative Dealers	Serving Proprietary Dealers
Power Unit				
Initial Cost	$ 29,500	$ 27,800	$ 38,300	$ 37,500
Age (Years)	4.8	5.5	3.6	3.7
Horsepower	243	248	296	290
Miles Per Gallon	5.3	5.2	5.2	5.2
Tank				
Initial Cost	13,200	13,600	26,100	27,000
Age (Years)	8.8	8.0	5.2	4.7
Efficiency Indicators				
Loads Per Day	1.7	1.8	1.1	1.2
Farm Stops Per Day	14.7	14.7	13.1	13.8
Pounds Milk Per Day	47,900	49,000	50,900	54,600
Miles Traveled Per Day	146	143	327	363
Hours Per Day	9.6	9.3	13.5	14.6

1/ All vehicles for haulers serving both types of handlers were included in each applicable group.

Table 33
Primary Hauling Functions of Trucks Serving Cooperative and Proprietary Handlers 1/
NY-NJ Federal Milk Marketing Order (Regions 4, 5, 6)
New York State, 1980

Primary Function	Straight Chassis		Tractor Trailers	
	Serving Cooperative Dealers	Serving Proprietary Dealers	Serving Cooperative Dealers	Serving Proprietary Dealers
Farm Pickup to Reload Station	11.9%	19.1%	1.0%	0.7%
Farm Pickup to Upstate Plant	72.6	68.4	14.4	13.6
Upstate Plant to Other Upstate Plant	0.0	0.0	2.9	1.4
Farm Pickup to Metro NYC Plant	4.4	0.0	31.7	37.1
Upstate Plant to Metro NYC Plant	0.0	0.0	2.9	5.7
Farm Pickup to Out-of-State Plant	1.5	1.8	27.9	22.9
Upstate Plant to Out-of-State Plant	0.0	0.0	9.6	7.9
Reserve Vehicle	9.6	10.7	9.6	10.7
Total	100.0%	100.0%	100.0%	100.0%
Total Vehicles	135	168	104	140

1/ All vehicles for haulers serving both types of handlers were included in each group.

Table 34
Vehicle and Tank Characteristics and Measures of Efficiency
for Trucks Serving Cooperative and Proprietary Handlers 1/
NY-NJ Federal Milk Marketing Order (Regions 4, 5, 6)
New York State, 1980

Item	Straight Chassis		Tractor Trailers	
	Serving Cooperative Dealers	Serving Proprietary Dealers	Serving Cooperative Dealers	Serving Proprietary Dealers
Power Unit				
Initial Cost	$ 28,700	$27,400	$38,600	$37,400
Age (Years)	5.6	6.0	3.5	3.7
Horsepower	250	251	290	288
Miles Per Gallon	5.4	5.4	5.2	5.2
Tank				
Initial Cost	$ 13,700	$14,300	$26,000	$27,300
Age (Years)	7.6	8.1	5.2	4.7
Efficiency Indicators				
Loads Per Day	1.8	1.8	1.1	1.2
Farm Stops Per Day	14.2	14.6	13.3	14.4
Pounds Milk Per Day	51,000	51,800	52,500	57,200
Miles Traveled Per Day	155	141	347	369
Hours Per Day	10.0	9.5	15.0	15.6

1/ All vehicles for the haulers serving both type of handlers were included in each group.

The efficiency measures indicated a greater difference in the federal order regions than they did in the state wide analysis. However, the differences are still not significant (Table 34).

Straight chassis serving both type of handlers assembled an average of 1.8 loads per day. However, on the average, vehicles serving cooperative firms made fewer farm stops (14.2 versus 14.6 stops) hauled fewer pounds of milk (51,000 versus 51,800 pounds) but traveled more miles (155 versus 141 miles) and spent more hours on the road (10.0 versus 9.5 hours) than the straight chassis hauling for proprietary firms. The evidence suggests straight chassis serving cooperative handlers may have less efficient assembly routes, because cooperatives have smaller and more out-of-way producers.

This conclusion was also applicable for tractor trailers serving cooperatives (Table 34). While the difference in the average number of routes per day was small (1.1 per day for tractor serving cooperatives compared to 1.2 per day for those hauling for proprietary handlers), the difference in the other efficiencies measures was much wider for the federal order regions than it was statewide. Tractor rigs serving cooperatives made fewer farm stops per day (13.3 versus 14.4), hauled fewer pounds of milk (52,500 versus 57,200), traveled fewer miles (347 versus 369) and operated fewer hours (15.0 versus 15.6). Although tractor trailers hauling for cooperatives are not as productive as those associated with proprietary firms, it is not possible to say it is due to the type of producers shipping milk to each type of handler.

Summary

There is some evidence to suggest trucks hauling for cooperative firms are not used as efficiently as those moving milk for proprietary dealers. In the case of straight chassis vehicles, this may be due to the fact that cooperatives have a higher proportion of small and out-of-the-way producers. In the case of tractor trailers, it appears that cooperatives are just not utilizing vehicles to the same extent as proprietary handlers.

Section V

SUMMARY AND RECOMMENDATIONS

Summary

Milk hauling in New York State is big business.

The study identified 678 vehicles operating in the state during the summer of 1980. It is estimated that the total number of trucks operating at that time was 750. The magnitude of the milk hauling industry is illustrated by the following.

Milk trucks in New York State are estimated to:

- Make 3.6 million farm stops annually
- Move 11 billion pounds of milk per year
- Travel approximately 55 million miles
- Consume 10 million gallons of fuel annually
- Represent an original investment of $37 million
- Would cost $55 million to replace in 1980 prices

The New York bulk milk assembly system is a major industry. But more important, it is the crucial link between milk producers and consumers. Consequently, it is essential that the hauling system remain economically viable and strive to improve its efficiency. This will require the coordination and cooperation of handlers, haulers and producers.

Recommendations

The following are steps that handlers, haulers and producers should and must take to assure an efficient and economically viable bulk milk assembly system in New York State. Many of these suggestions have been proposed before, but they bear repeating. 1/

Handlers

1. Greater Vehicle Utilization

   The already high and increasing cost of vehicles makes it imperative that trucks be utilized to the fullest extent possible. Milk handlers should adopt measures, perhaps incentives, to encourage milk haulers to increase the utilization of vehicles by increasing the number of loads and hours of operation per day, but most important to increase the amount of milk moved per truck per day. By increasing utilization it is possible to spread fixed vehicle costs over a greater

1/ Wasserman, W. C. and W. H. Lesser, "An Analysis of the Organization and Structure of Bulk Milk Assembly in the Western New York State Order Markets with Recommendations for Improving Truck Productivity", A. E. Ext. 8024, (Ithaca: Cornell University, Department of Agricultural Economics, November 1980).

number of pounds of milk and thereby reduce the unit costs of milk transportation. In the long-run increased utilization will reduce the total number of vehicles required to assemble milk. The study indicates there is substantial room for improvement in the area of truck utilization. While haulers also have a role in this effort and handlers should work with haulers to improve vehicle productivity, it is the responsibility of handlers to provide the incentive for these changes. Unfortunately, the transportation provisions of the New York-New Jersey Milk Marketing Order that became effective September 1981 are not likely to encourage handlers to minimize hauling costs or improve vehicle utilization since in general transportation costs can be passed along to producers. 1/

2. Differential Hauling Rates

Whereever possible economic incentives and disincentives should be used to increase the efficiency of the assembly system. Cooperative handlers have greater flexibility with respect to this issue than proprietary firms. Stop charges and variable per hundredweight fees are used to price on the basis of volume of production. These rate differentials do not make an adjustment for farm location. Since the value of milk produced on out-of-the-way farms is less than the value of milk produced on more locationally convenient farms, it is economically justifiable to allow out-of-the-way farmers to bear a higher proportion of the cost of picking up their milk. A mileage charge could encourage farmers in a given area to assist handlers in consolidating milk assembly operations.

3. Route Management

Handlers could also improve hauling efficiency by better route management. The objective should be to minimize the costs of milk assembly. A major element of cost minimization is full utilization of vehicles. In order to accomplish this goal routes should be reviewed on a regular basis and adjustments made whenever there is a significant change in milk production. This can be done manually or using computer assisted techniques.

1/ Agricultural Marketing Service "Milk in the New York-New Jersey Marketing Area; Amendments to Marketing Agreement and Order," Federal Register Vol. 46, No. 122, (Washington, D.C.: U.S. Department of Agriculture, June 25, 1981).

4. Coordination and Cooperation Between Dealers

The goal of improved productivity should be to optimize the efficiency of the New York State milk hauling system. It is possible that this goal will not be accomplished even if each handler optimized his own hauling network. To reduce the costs of the system requires inter-firm coordination and cooperation. A current example of this is "milk swapping" - whereby the milk on some loads belongs to several dealers and ownership is only a matter of bookkeeping rather than physical handling. Greater consolidation of routes into a single firm is another way to achieve increased coordination and cooperation.

5. Less Waiting Time At Plants

A common complaint among milk haulers was the excessive time they spent at plants waiting to unload. Needless waiting imposes substantial costs on the hauling system by preventing the full utilization of trucks and drivers. Waiting time is a problem because plants do not directly bear the costs of waiting. Some haulers do have agreements with handlers to allow the imposition of a demurrage charge, but many haulers are unwilling to bill handlers because they are dependent on good relations with the handlers. One solution to this problem is scheduled receiving at plants. Plant scheduling can improve receiving operations and reduce waiting time without any additional investment in plant or equipment.

Haulers

1. Improved Record Keeping

In an environment of escalating prices, it is essential that milk haulers have an accurate idea of the financial performance of their operation. This requires good financial statements. Detailed records should be kept on the costs and performance of each vehicle. Also essential are an operating statement and a balance sheet for the entire operation. Sound business decisions require accurate and timely information.

2. Practice Good Business Management

Good financial records alone are not enough. The records should be used to make sound business management decisions. Haulers should become more familiar with simple business management practices. Topics that would be most helpful include: 1) how to allocate fixed costs (vehicle costs) 2) how to decide whether to lease or buy vehicles and tanks 3) how to price hauling services and 4) how to minimize procurement costs.

3. Develop a Reserve Vehicle System

Reserve vehicles accounted for 15 percent of the vehicles operating in New York State. There is a significant cost associated with maintaining a reserve fleet. Consequently the number of reserve vehicles should be kept to a minimum. Currently each hauler is responsible for maintaining backup services. It may be possible to reduce the cost and number of vehicles needed if haulers would coordinate their efforts.

Producers

1. Be More Flexible About Pickup Times

   Hauling costs could be reduced if fewer vehicles were needed and fewer vehicles would be required if haulers operated their vehicles more hours per day. 1/ This implies more night pickups. Night pickups are inconvenient, but convenience has a cost. If producers are interested in controlling hauling costs they must be willing to be more flexible about milk pickup. One way for handlers to encourage night pickups would be to provide an incentive in the form of hauling rate discounts.

2. Reduce Every Day Pickups

   A significant portion of New York State milk is still picked up at the farm every day. Additional savings in hauling costs can be realized by reducing the number of farms with every day stops.

3. Eliminate On-Farm Waiting Time

   Haulers indicated that on-farm waiting time is a serious problem. It is caused by late milkings, blocked driveways, and poor access to the milk house. Greater attention to these issues can reduce many of them. If this is unsuccessful, an on-farm demurrage charge could be instituted, at least in the case of cooperative handlers.

4. Reduce Production Seasonality

   Like many segments of the milk industry the hauling sector maintains the capacity to handle the high volume during the spring flush. Consequently, the hauling system has a significant amount of idle capacity during the rest of the year. 2/ If there was a reduction in the seasonality of production fewer total vehicles would be required. Currently there is little incentive for individual farmers to reduce their seasonality. However, adoption of an incentive system, such as a base-excess plan market wide or by individual handlers, could help eliminate some of the seasonality in production.

Many of the above recommendations require increased use of economic incentives and disencentives. Cooperative handlers have a greater opportunity to utilize these measures than proprietary firms. However, there are steps that every segment of the milk industry can take to help improve the efficiency of milk haulers.

1/ This does not necessarily imply drivers would be on the road more hours per day.
2/ Many vehicles may not be idle but merely operate at less than full capacity.

Conclusions

The milk assembly system in New York State is a large industry. Moreover, it is a vital link between milk producers and consumers. Increased costs have had a significant impact on the economic health of the system. The purpose of this study was to outline the current structure and characteristics of the system and identify areas of possible problems and potential improvements.

Fixed vehicle costs are probably the largest cost component in hauling rates. Typically, it is difficult to allocate fixed costs when pricing hauling services, especially when vehicle costs are escalating. However, improved operating efficiency is one way to partially offset increased costs. There are several ways to improve hauling efficiency. Their common purpose is to increase vehicle utilization and spread the fixed costs of hauling over a larger volume of milk. Real efficiency improvements require the coordinated and cooperative effort of all parties - namely handlers, haulers and producers.

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Appendix A

Milk Hauling Survey

Form Number_____

CONFIDENTIAL

Department of Agricultural Economics
Cornell University

Milk Hauling Survey

Your Name_____

Address_____Phone ( )_____

1. Do you operate one or more milk trucks in New York State? (Check One)
   _____Yes. If yes, please complete the rest of the form
   _____No. If no, return the survey in the self-addressed stamped envelope.

2. Which milk dealers do you haul for: (Please list names)

   _____ _____ _____

   _____ _____ _____

   _____ _____ _____

3. Please list all counties in which you have one or more farm stops.

   _____ _____ _____

   _____ _____ _____

   _____ _____ _____

4. How many vehicles do you operate all year-round?

   _____Number of straight chassis trucks used year-round.

   _____Number of tractors used year-round.

   _____Number of tank trailers used year-round.

5. Number of additional vehicles used during the flush period or as reserves?

   _____Additional straight chassis trucks

   _____Additional tractors

   _____Additional tank trailers

6. If you do not maintain reserve vehicles, how do you meet your needs in flush periods or when vehicles break down? (Check the appropriate answers)

- ☐ Spread hauling demands over existing vehicles
- ☐ Temporarily rent or lease additional vehicles
- ☐ Request assistance from fellow milk hauler
- ☐ Request assistance from milk dealer
- ☐ Other (Please specify)_____

7. What was the most recent price you paid for fuel?

Gasoline: $_____per gallon.

Diesel: $_____per gallon.

8. If you have hired drivers, what is their average hourly wage rate?

Wage rate: $_____per hour.

9. Approximately what percent of your farm stops are every day pick ups?

Every day pick ups: _____ percent

10. Of the vehicles you operate, how many are owned by:

	Straight Trucks		Semi Rigs	
	Chassis	Tanks	Tractors	Trailers
Yourself, or your firm				
A cooperative dealer				
A proprietary dealer				
An independent leasing firm				
Another private individual				
Other (Please specify)_____				

11. Of the vehicles you own, how many were financed by:

	Straight Trucks		Semi Rigs	
	Chassis	Tanks	Tractors	Trailers
Completely by yourself or your firm				
A loan through the truck dealership				
A loan through a commercial bank				
A loan through a private lender				
A loan through a milk dealer				
Other (Please specify)				

Please answer the following questions for each straight truck and tractor-trailer you operate.

Our identification of each vehicle:	#1	#2	#3	#4	#5	#6	#7	#8	#9
12. Make of truck or tractor chassis: (Check one)									
Brockway	☐	☐	☐	☐	☐	☐	☐	☐	☐
Chevrolet	☐	☐	☐	☐	☐	☐	☐	☐	☐
Ford	☐	☐	☐	☐	☐	☐	☐	☐	☐
GMC	☐	☐	☐	☐	☐	☐	☐	☐	☐
International	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mack	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other(Specify)	_____	_____	_____	_____	_____	_____	_____	_____	_____
13. Model year of chassis:	_____	_____	_____	_____	_____	_____	_____	_____	_____
14. Total number of years you expect to keep each chassis.	_____	_____	_____	_____	_____	_____	_____	_____	_____
15. Type of chassis: (Check one)									
Single axle-straight chassis	☐	☐	☐	☐	☐	☐	☐	☐	☐
Dougle axle-straight chassis	☐	☐	☐	☐	☐	☐	☐	☐	☐
Tractor	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other (Specify)	_____	_____	_____	_____	_____	_____	_____	_____	_____

Our identification of each vehicle:	#1	#2	#3	#4	#5	#6	#7	#8	#9
16. Maximum gross weight of each vehicle?	_____	_____	_____	_____	_____	_____	_____	_____	_____
17. Type of fuel used: (Check one)									
Gasoline	☐	☐	☐	☐	☐	☐	☐	☐	☐
Diesel	☐	☐	☐	☐	☐	☐	☐	☐	☐
18. Approximate miles per gallon:	_____	_____	_____	_____	_____	_____	_____	_____	_____
19. Engine horsepower:	_____	_____	_____	_____	_____	_____	_____	_____	_____
20. If you own the truck or tractor, approximate cost when it was new?	_____	_____	_____	_____	_____	_____	_____	_____	_____
21. Approximate cost to replace the truck or tractor today?	_____	_____	_____	_____	_____	_____	_____	_____	_____

Our identification of each vehicle:	#1	#2	#3	#4	#5	#6	#7	#8	#9
22. If you lease the truck or tractor, annual cost of the lease?	_____	_____	_____	_____	_____	_____	_____	_____	_____
23. Tank capacity: (Check one)									
Less than 3500 gallons	☐	☐	☐	☐	☐	☐	☐	☐	☐
3500-3749 gal.	☐	☐	☐	☐	☐	☐	☐	☐	☐
3750-3999 gal.	☐	☐	☐	☐	☐	☐	☐	☐	☐
4000-4499 gal.	☐	☐	☐	☐	☐	☐	☐	☐	☐
4500-4999 gal.	☐	☐	☐	☐	☐	☐	☐	☐	☐
5000-5499 gal.	☐	☐	☐	☐	☐	☐	☐	☐	☐
5500-5999 gal.	☐	☐	☐	☐	☐	☐	☐	☐	☐
6000 gal. & over	☐	☐	☐	☐	☐	☐	☐	☐	☐
24. Milk pump capacity: (Check one)									
Less than 40 gal. per minute	☐	☐	☐	☐	☐	☐	☐	☐	☐
40-59 gal/min.	☐	☐	☐	☐	☐	☐	☐	☐	☐
60-79 gal/min.	☐	☐	☐	☐	☐	☐	☐	☐	☐
80-99 gal/min.	☐	☐	☐	☐	☐	☐	☐	☐	☐
100 gal/min.& over	☐	☐	☐	☐	☐	☐	☐	☐	☐

Our identification of each vehicle:	#1	#2	#3	#4	#5	#6	#7	#8	#9
25. How many years old is each tank or tank trailer?									
26. Total number of years you expect to keep each tank or tank trailer?									
27. If you own the tank or tank trailer, approximate cost when it was new?									
28. Approximate cost to replace each tank or tank trailer today?									
29. If you lease the tank or tank trailer, annual cost of the lease?									

Our identification of each vehicle:	#1	#2	#3	#4	#5	#6	#7	#8	#9
30. The PRIMARY function of each vehicle? (Check one)									
Farm pickup to reload station	☐	☐	☐	☐	☐	☐	☐	☐	☐
Farm pickup to upstate plant	☐	☐	☐	☐	☐	☐	☐	☐	☐
Farm pickup to metropolitan New York City plant	☐	☐	☐	☐	☐	☐	☐	☐	☐
Farm pickup to out-of-state plant	☐	☐	☐	☐	☐	☐	☐	☐	☐
Upstate plant to another upstate plant	☐	☐	☐	☐	☐	☐	☐	☐	☐
Upstate plant to metropolitan New York City plant	☐	☐	☐	☐	☐	☐	☐	☐	☐
Upstate plant to out-of-state plant	☐	☐	☐	☐	☐	☐	☐	☐	☐
Reserve or backup vehicle	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other(Specify) _____	_____	_____	_____	_____	_____	_____	_____	_____	_____

Our identification of each vehicle:	#1	#2	#3	#4	#5	#6	#7	#8	#9
31. Average number of loads hauled by each vehicle? (Check one)									
4 or more loads per day	☐	☐	☐	☐	☐	☐	☐	☐	☐
3 loads per day	☐	☐	☐	☐	☐	☐	☐	☐	☐
2 loads per day	☐	☐	☐	☐	☐	☐	☐	☐	☐
3 loads every 2 days	☐	☐	☐	☐	☐	☐	☐	☐	☐
1 load per day	☐	☐	☐	☐	☐	☐	☐	☐	☐
2 loads every other day	☐	☐	☐	☐	☐	☐	☐	☐	☐
No loads	☐	☐	☐	☐	☐	☐	☐	☐	☐
Reserve vehicle									
Other (Please specify)	_____	_____	_____	_____	_____	_____	_____	_____	_____

Since many trucks have different routes on different days, please answer the following questions for any two consecutive week days (for example, a recent Tuesday and Wednesday, or a recent Wednesday and Thursday).

Vehicle:	#1	#2	#3	#4	#5	#6	#7	#8	#9
32. Total number of farm stops									
First Day	_____	_____	_____	_____	_____	_____	_____	_____	_____
Next day	_____	_____	_____	_____	_____	_____	_____	_____	_____

Our identification of each vehicle:	#1	#2	#3	#4	#5	#6	#7	#8	#9
33. Pounds of milk hauled									
First day									
Next day									
34. Total miles traveled from garage to garage									
First day									
Next day									
35. Total truck time from garage to garage									
First day									
Next day									

36. Additional comments about your milk hauling situation.

Thank you for your cooperation. PLEASE RETURN BY JUNE 23 TO:

BRUCE L. ANDERSON
Department of Agricultural Economics
356 Warren Hall
Cornell University
Ithaca, New York 14853

Appendix B

Number of Haulers and Vehicles Available in Each County and Region

Table B1
Number of Haulers and Vehicles Available in Each County and Region 1/
New York State, 1980

Region and County	Number of Haulers	Number Available Year Around			Number Available Reserve Vehicles		
		Straight Chassis	Tractors	Trailers	Straight Chassis	Tractors	Trailers
Region 1 - Southwestern NY							
Chautauqua	10	40	2	2	6	0	0
Cattaraugus	14	64	2	2	8	0	1
Allegany	11	65	10	6	6	0	0
Steuben	9	60	16	12	4	2	2
Region Total	29	125	19	15	12	2	2
Region 2 - Western NY							
Niagara	2	2	0	0	0	0	0
Erie	10	46	1	1	4	0	0
Orleans	3	11	4	4	1	0	0
Genesee	10	27	3	3	2	0	0
Wyoming	21	73	7	6	8	1	1
Monroe	10	24	7	7	2	1	0
Livingston	15	58	15	10	4	1	0
Wayne	5	17	5	5	2	2	2
Ontario	7	30	8	8	3	2	2
Yates	5	48	16	12	3	2	2
Seneca	6	33	5	5	5	2	2
Region Total	46	160	24	15	12	2	2
Region 3 - Northern NY							
Jefferson	20	34	3	3	3	0	0
St. Lawrence	14	25	3	3	3	0	0
Lewis	14	33	15	15	5	1	1
Franklin	9	16	0	0	3	0	0
Hamilton	0	0	0	0	0	0	0
Region Total	38	68	18	18	9	1	1

Region and County	Number of Haulers	Number Available Year Around			Number Available Reserve Vehicles		
		Straight Chassis	Tractors	Trailers	Straight Chassis	Tractors	Trailers
Region 4 - South Central NY							
Schuyler	6	48	17	13	4	2	2
Chemung	8	46	13	9	5	1	1
Cayuga	6	46	19	21	8	3	3
Tompkins	9	67	21	19	8	3	3
Tioga	11	49	21	17	5	2	1
Cortland	7	37	29	38	7	2	1
Broome	8	36	21	30	7	2	1
Chenango	10	46	36	45	11	6	3
Otsego	7	27	26	26	7	6	3
Region Total	29	109	68	72	16	9	5
Region 5 - Mohawk Valley							
Oswego	10	42	4	4	6	2	2
Onondaga	8	55	11	20	10	3	3
Oneida	10	25	23	30	4	2	1
Madison	9	41	26	35	8	4	2
Herkimer	7	31	39	36	6	7	11
Fulton	4	10	7	7	1	1	1
Montgomery	6	12	33	33	3	2	9
Schoharie	6	13	41	41	4	3	9
Schenectady	6	12	33	33	3	2	9
Albany	3	9	26	26	3	1	8
Region Total	32	110	93	98	21	14	23

Region and County	Number of Haulers	Number Available Year Around			Number Available Reserve Vehicles		
		Straight Chassis	Tractors	Trailers	Straight Chassis	Tractors	Trailers
Region 6 - Southeastern NY							
Delaware	9	34	51	48	9	11	12
Sullivan	4	8	20	20	1	6	6
Greene	3	4	26	26	2	1	8
Ulster	2	1	18	18	1	6	5
Orange	5	9	22	23	1	7	7
Rockland	0	0	0	0	0	0	0
Region Total	16	44	96	94	10	19	27
Region 7 - Hudson Valley							
Clinton	9	7	1	1	4	0	0
Essex	2	8	2	2	0	0	0
Warren	2	3	0	0	2	0	0
Saratoga	8	14	30	30	3	2	9
Washington	10	16	22	23	5	1	8
Rensselaer	8	14	38	38	3	4	10
Columbia	7	2	44	44	0	6	12
Dutchess	7	3	43	43	0	6	12
Putnam	2	1	18	18	1	6	5
Westchester	0	0	0	0	0	0	0
Region Total	32	38	60	60	10	10	16
New York State	150	388	207	213	52	31	36

1/ All vehicles for haulers operating in more than one county or region were included in each applicable county and region.